

What is claimed is:

1. A flexbeam having flapping portions and lead-lag and feathering portions, each lead-lag and feathering portion comprising:

a central portion having an approximate plate-like shape with an elongated and narrow width;

middle portions each of which has an approximate plate-like shape and which continuously connects to the central portion and branches from both ends of the central portion extending along the longitudinal direction thereof, and extends upward and downward; and

edge portions each of which has an approximate plate-like shape and which continuously connects to the middle portion and bends from each end of the middle portions and extends almost in parallel with the central portion,

wherein at corners formed on at least one of branch portions and bending portions, concaves each of which has a cross-section of an approximate arc shape and which continuously and smoothly connects to two surfaces forming each of the corners and is formed inside extended planes of the two surfaces.

2. The flexbeam according to claim 1, further comprising a doubler made of composite material, for covering at least one of the concaves.

3. The flexbeam according to claim 2, wherein the doubler is made of a sheet type of fiber reinforced composite material which is made from a prepreg obtained by impregnating a woven reinforced composite fiber material with a thermosetting resin.

4. The flexbeam according to claim 1, wherein the portion having an approximate plate-like shape has a minimum cross-sectional thickness at the concave portion, which is in a range of 80-90% of a thickness at a flat region thereof.

5. A flexbeam having flapping portions and lead-lag and feathering portions, each lead-lag and feathering portion comprising:

a first composite material extending in a beam length direction and having a plurality of fiber orientations; and second composite material extending in the beam length direction and having the fiber orientation in the same direction as the beam length direction, the first composite material and the second composite material being joined integrally,

wherein the first composite material comprises:

a center portion arranged at an approximate center in

a beam thickness direction and extending in a beam width direction;

first extending portions that extend in a beam front edge direction and a beam rear edge direction so as to branch from both ends of the center portion to beam upper and lower directions; and

second extending portions that extend in the beam front edge direction and the beam rear edge direction so as to bend almost in parallel with the center portion at ends of the first extending portions, and

the second composite material comprises:

upper-and-lower portions arranged on upper and lower surfaces of the center portion, of the first extending portions and of the second extending portions, respectively; and

front-and-rear edge portions arranged on beam front edge and rear edge side surfaces of the first extending portions and the second extending portions,

wherein concaves are formed on at least one of branch portions formed by the center portion, the first extending portions, the upper-and-lower portions and the front-and-rear edge portions, and bending portions formed by the first extending portions, the second extending portions, the upper-and-lower portions and the front-and-rear edge portions.

6. The flexbeam according to claim 5, further comprising a doubler made of composite material, for covering at least one of the concaves.

7. The flexbeam according to claim 6, wherein the doubler is made of a sheet type of fiber reinforced composite material which is made from a prepreg obtained by impregnating a woven reinforced composite fiber material with a thermosetting resin.

8. The flexbeam according to claim 5, wherein the first composite material is a glass fiber reinforced one which comprises one or more sheets of prepreg obtained by impregnating a woven glass fiber with a thermosetting resin.

9. The flexbeam according to claim 5, wherein the second composite material is loop material in which glass fibers are extended in a direction and impregnated with a thermosetting resin.

10. The flexbeam according to claim 5, further comprising a third composite material covering surfaces of the portions comprising the first and second composite material.

11. The flexbeam according to claim 10, wherein the

third composite material is a glass fiber reinforced one which comprises one or more sheets of prepreg obtained by impregnating a woven glass fiber with thermosetting resin.